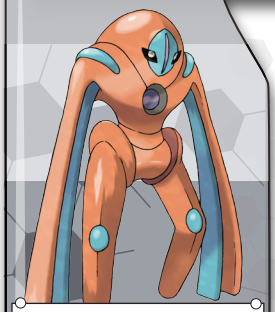
What is a Meteorite?



LEARN the real **science** behind DEOXYS

Pokémon TRADING CARD GAME

DEOXYS is a new Pokémon character in the Trading Card Game, and there is real world science behind its story.

For more real science visit:
http://ksnn.larc.nasa.gov/pokemon

MATERIALS

For each group:

- Several sheets of newspaper
- Box or pan filled 6–8 cm deep with flour
- Sifter
- Chocolate-drink mix or dry tempera paint powder
- Marbles
- Ruler

PURPOSE

To simulate a ***meteor shower*** and learn about the shape, size, and features of craters created by ***meteorites***

BACKGROUND

Meteors, commonly called shooting stars, are particles similar in size to grains of sand. Most vaporize due to friction when they travel through the Earth's atmosphere. Any meteors sturdy enough to reach the Earth's surface are called ***meteorites***. Tiny ones are ***micrometeorites***.

Every few years, ***meteorites*** are large enough to mark the Earth's surface with craters. The odds suggest that every 10,000 years, a mountain-sized meteorite might slam the Earth. Don't worry. There's only a one in four chance that this Goliath meteorite will hit land. Most fall into water.

The Moon and other moons and planets with thin atmospheres aren't as protected as Earth. Because of this lack of protection, their surfaces are dotted with craters.

PROCEDURE

1. Spread newspapers on the floor. Fill a box or pan 6–8 cm deep with flour.

   Level the surface with a piece of cardboard. Use the sifter to dust the surface of the flour with a light coating of chocolate-drink mix or the tempera paint powder.
2. Drop a marble 50 cm above the flour.
3. Measure the crater created by the marble's impact.
4. Move to another spot of flour. Drop the marble from 50 cm again.
5. Measure the crater's depth. Repeat one more time.
6. Smooth the flour. Hold the marble 100 cm above the flour. Before you drop the marble, predict the depth of the crater. Drop the marble. Measure the crater's depth.
7. Repeat the marble drop from a height of 100 cm two more times.
8. Smooth the flour. Predict the depth of the crater if you were to drop the marble from a height of 150 cm.
9. Drop the marble from this height three times.
10. Repeat this activity by throwing the marble. Before you begin, predict how throwing the marble will compare to dropping it.

CONCLUSION

1. How did the height of the marble affect the depth of the crater?
2. What differences did you observe between dropping and throwing the marbles?

   How might the craters be different if the flour were wet?
3. How will the craters differ if you repeat this activity with a lighter marble? Heavier marble?
4. What other factors might affect the craters?

EXTENSIONS

1. Create a "pock-marked" surface by dropping the marble on the flour 10 times. Purposefully drop the marble from different heights. Challenge another team to look at your newly cratered landscape and make inferences about the surface.
2. Craters on the surface of the Moon haven't changed much since they were created. Why not?
3. Identify these features of the impact craters: ***ejecta***, ***raised rim***, and ***rays.*** ***Ejecta*** make up a layer of debris that surrounds the crater. The ***raised rim*** is the edge that surrounds the crater. When material is propelled from the surface, radiating from the impact, the results are called ***rays***.